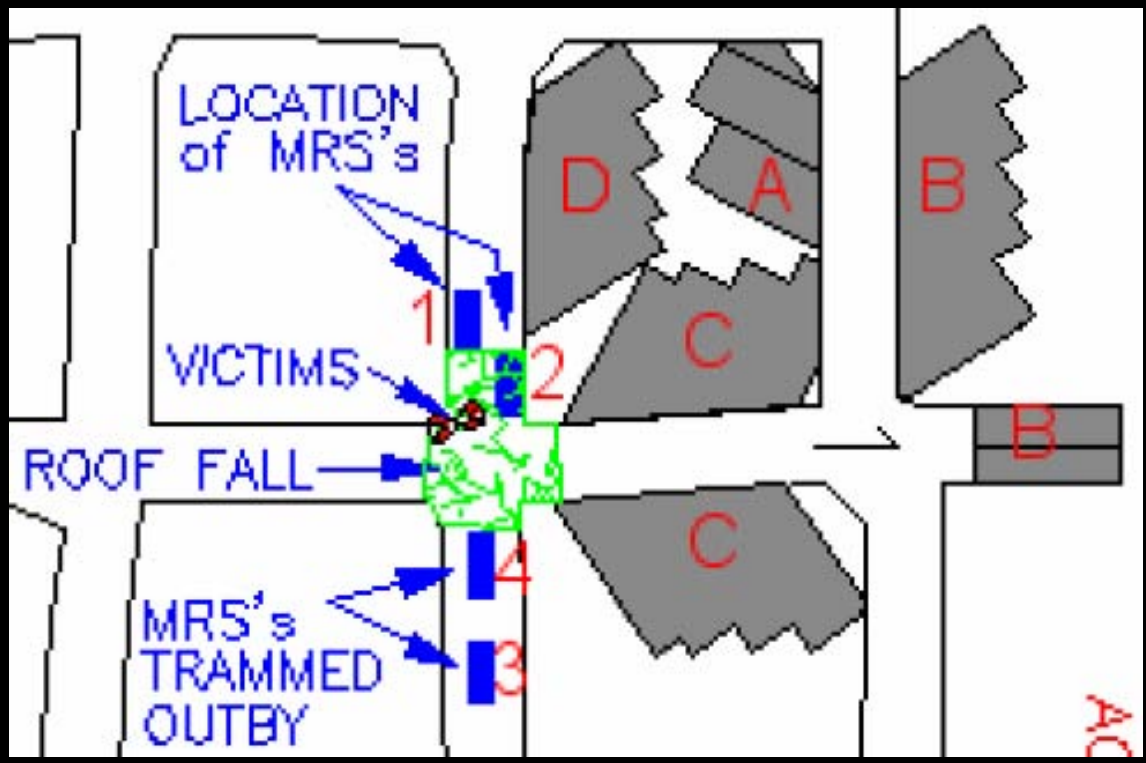
*This presentation is for illustrative and **general** educational purposes only and is not intended to substitute for the official MSHA Investigation Report analysis nor is it intended to provide the sole foundation, if any, for any related enforcement actions.*

GENERAL INFORMATION

Coal Mine Fatal Accident 2005-11&12

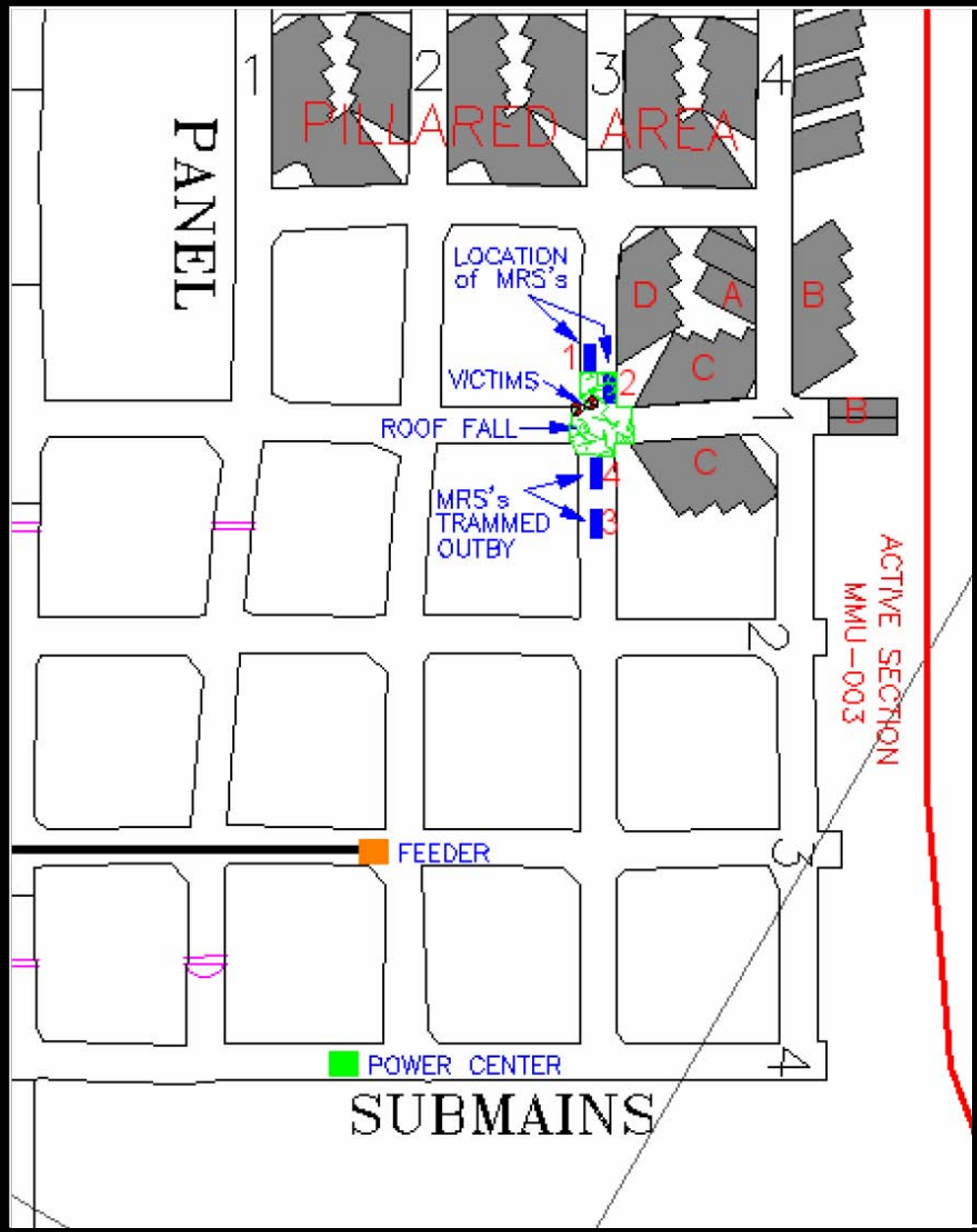


Operator:	Stillhouse Mining LLC
Mine:	Mine No. 1
Accident Date:	August 3, 2005
Classification:	Roof fall
Location:	Dist. 7, Harlan County, Kentucky
Mine Type:	Underground
Employment:	76
Production:	5,000 tons raw coal/day

ACCIDENT DESCRIPTION

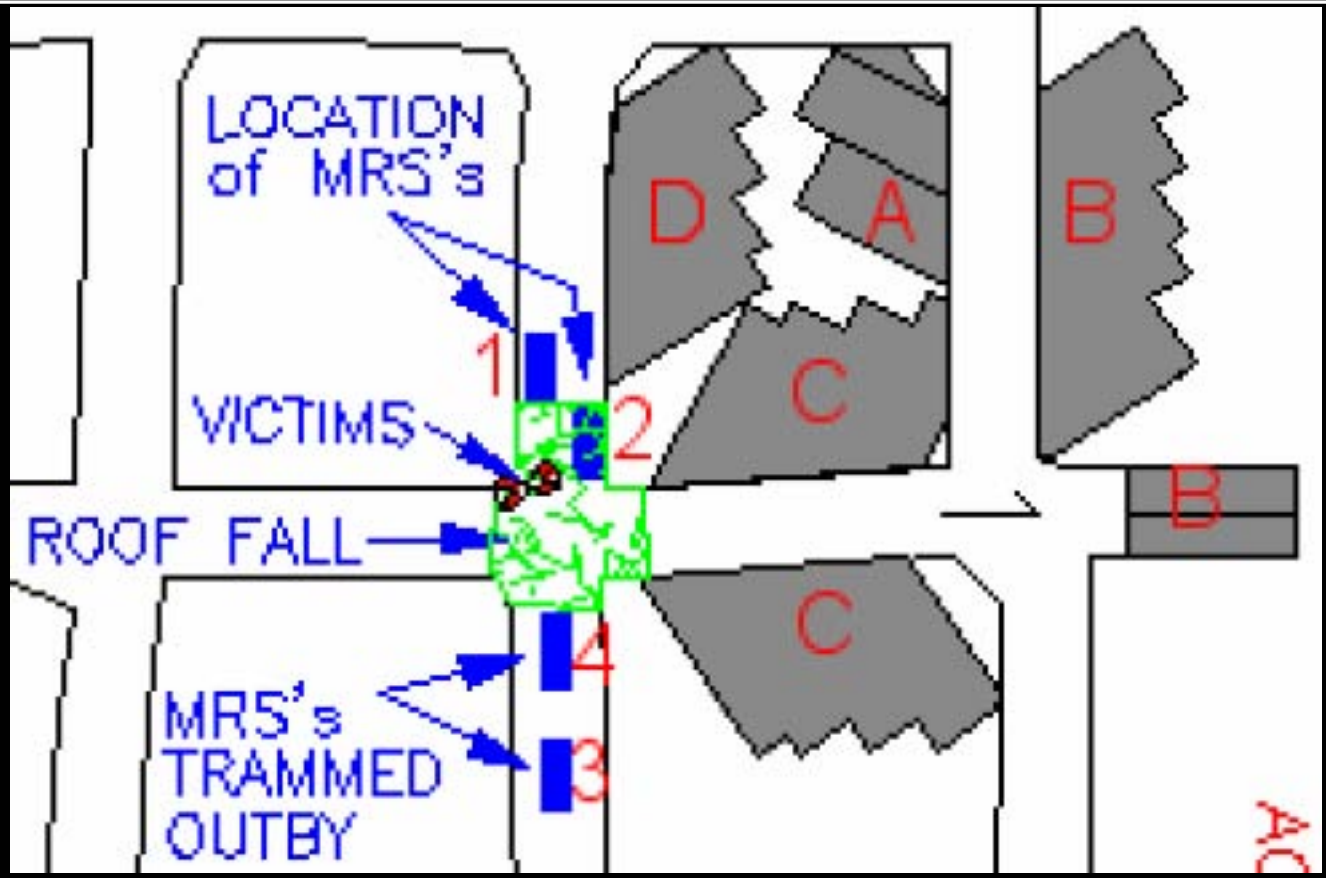
At approximately 7:00 a.m., the day shift entered the mine and set up the equipment to begin pillar recovery of the last pillar on the right side the 1 Left Panel. Instead of recovering pillars across the Submains from left to right, as directed by management, the day shift section foreman decided to recover the last row of pillars from the 1 Left Panel, mining from right to left.

ACCIDENT DESCRIPTION



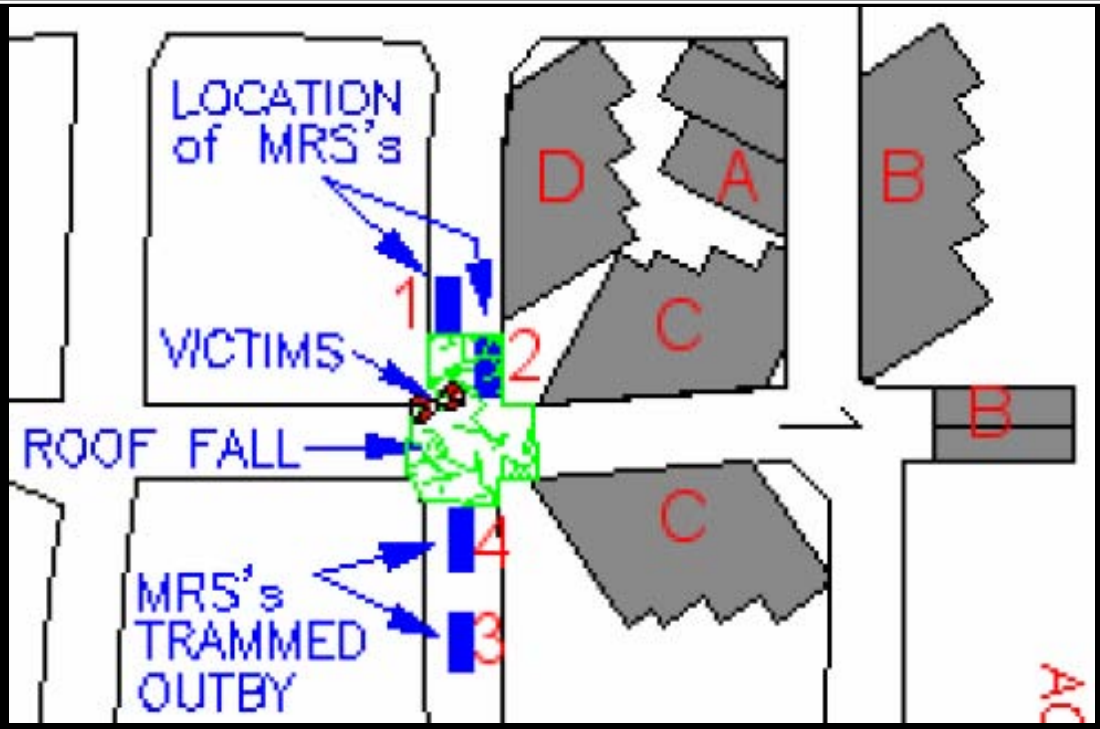
Alternating mining lifts were commenced to the left and right from the 1 Left Panel No. 4 entry (cuts A and B). After the fourth lift (B) was mined to the right of the entry, the conveyor belt stopped allowing time for the continuous mining machine cable to be rerouted, and breaker timbers to be set in the last open crosscut between the Submains Nos. 1 and 2 entries. After the belt was started, they mined three more lifts (B) to the right of the No. 4 entry and two 30 foot lifts straight off the inby end of the Submains No. 1 entry.

ACCIDENT DESCRIPTION



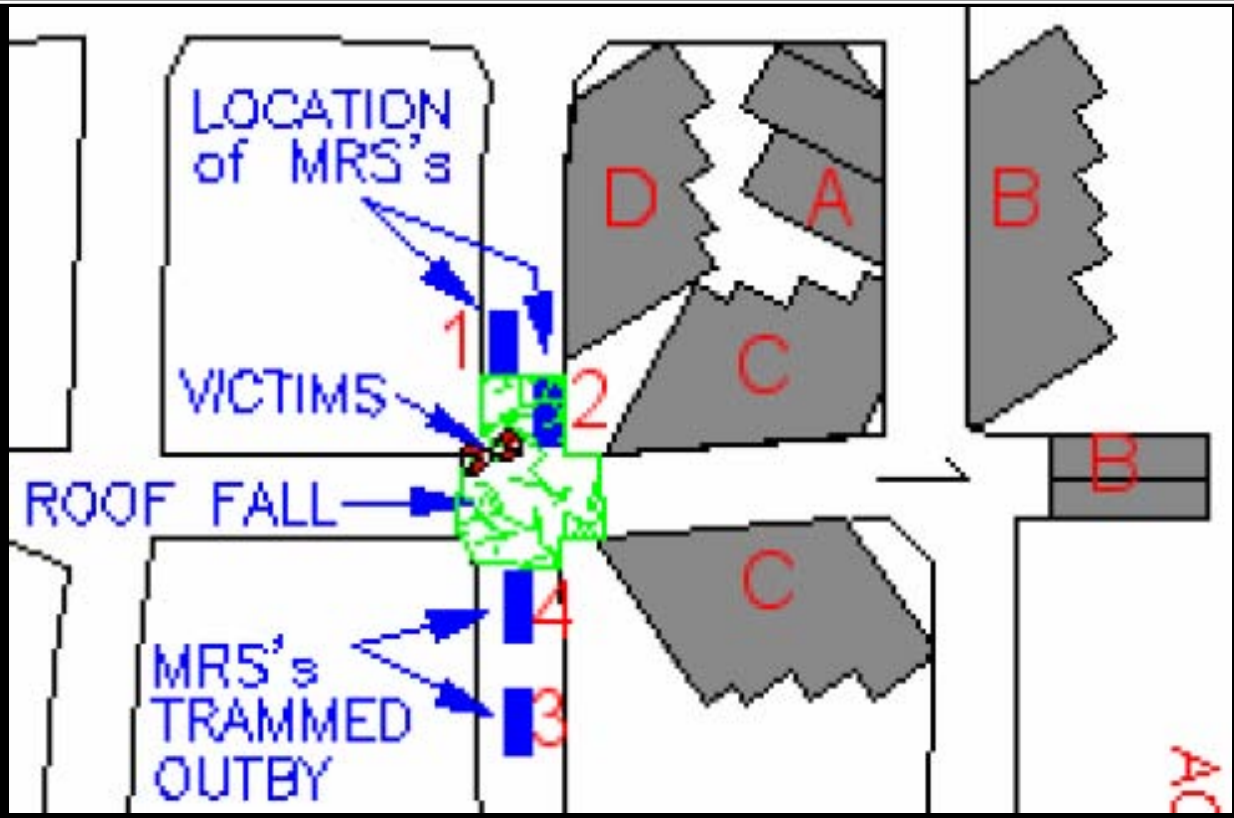
At approximately 3:00 p.m., the second shift crew entered the mine. The second shift continuous mining machine operator mined alternating left and right lifts (C) from the Submains No. 1 entry. The MRS units were moved as the lift sequence advanced. At about the time that the second lift was being mined, a shuttle car operator, noticed that the roof was working in the Submains No.1 entry, outby the intersection with the No. 3 entry of the 1 Left Panel. He informed a MRS operator of the condition.

ACCIDENT DESCRIPTION



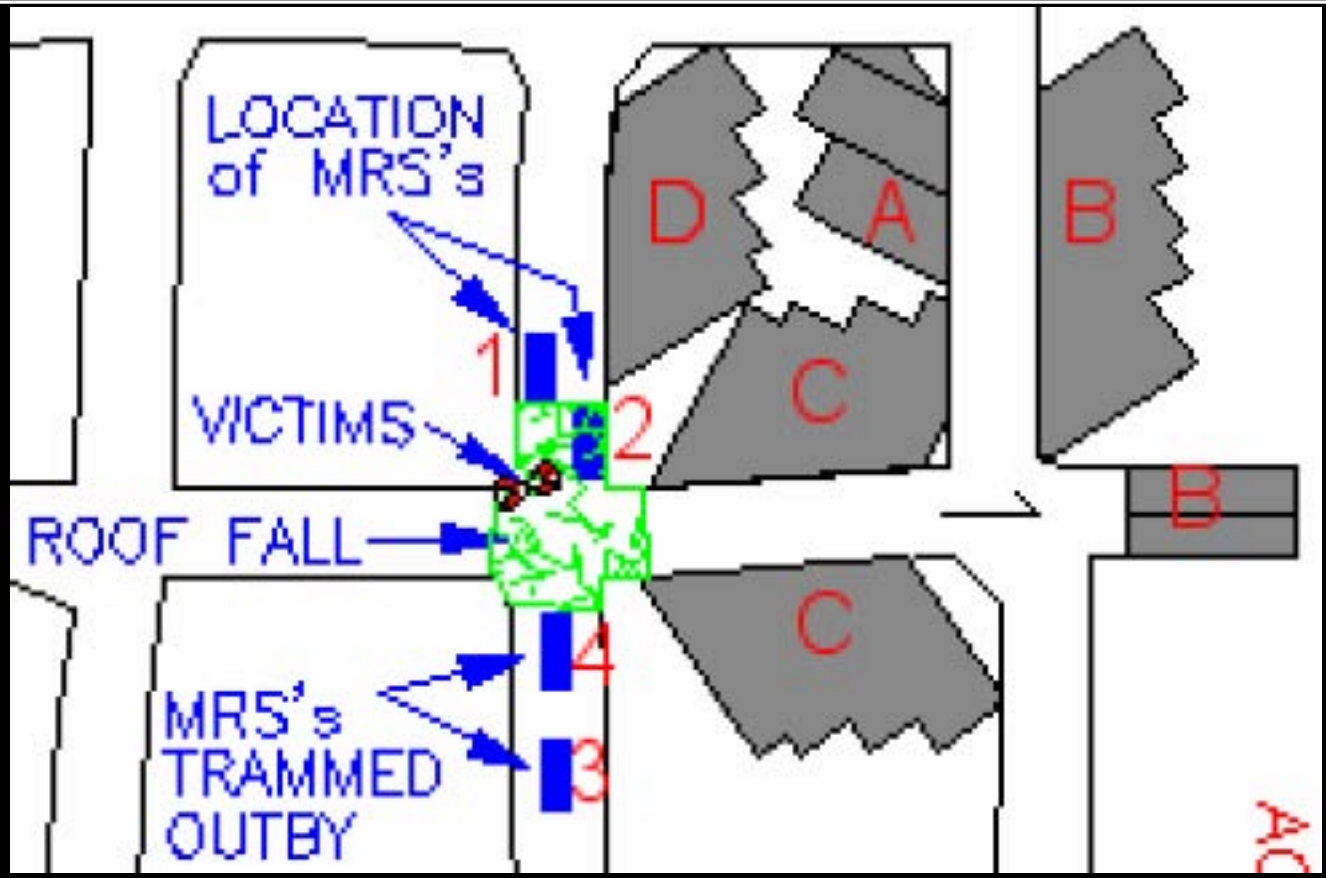
The MRS operator checked two 6-foot test holes and no hazards were detected. He then checked a 12 foot test hole in the affected intersection and found a separation at 11 feet and 5 inches. He told victim A, the section foreman, about the crack. Victim A checked the 12-foot test hole, but took no corrective action and made no further mention about the matter. The MRS operator continued checking to see if the separation was widening after every two or three shuttle cars. While mining was being conducted in region C, The MRS operator told another supervisor about the crack, the acting second shift mine foreman, but he indicated no concern regarding the condition. The MRS units were moved as each lift (C) was completed.

ACCIDENT DESCRIPTION



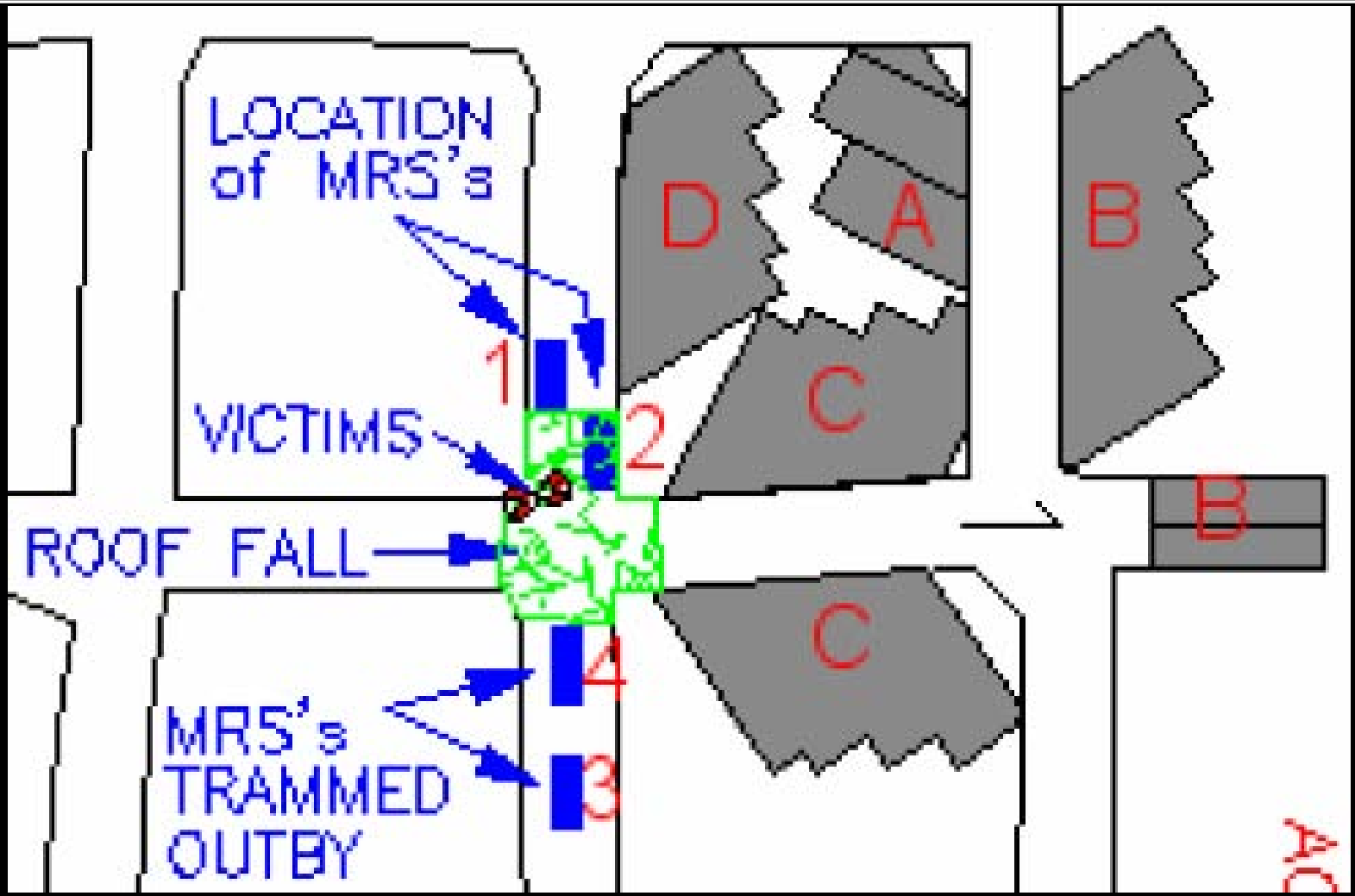
The crew then mined lifts (D) from the remainder of the pillar to the right of the entry. During this time, the Nos. 1 and 2 MRS units were located in the 1 Left Panel No. 3 entry and were moved outby with each lift, while the Nos. 3 and 4 MRS units were stationary across the Submains No. 1 entry. As the continuous mining machine was backing out of the final cut (D), a piece of draw rock, approximately 18 inches thick by 7 feet long, fell off the machine onto the mine floor of the 1 Left panel No. 3 entry, in front of the No. 1 MRS (which was located on the left side of the entry, adjacent to the solid pillar).

ACCIDENT DESCRIPTION



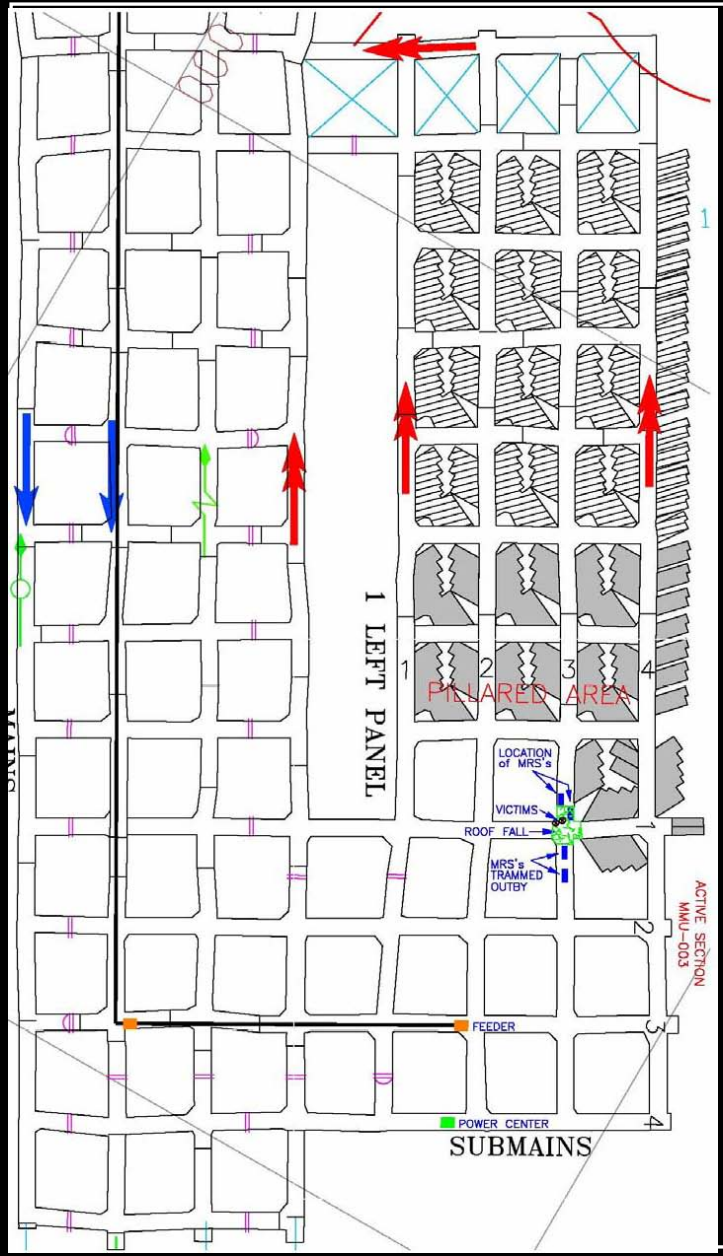
The MRS operator and a shuttle car operator, began moving the Nos. 1 and 2 MRS units forward. When they then attempted to push the fallen draw rock with the No. 1 MRS, the draw rock wedged between the coal rib and the No. 2 MRS track. They next began moving the Nos. 3 and 4 MRS units out of the Submains No. 1 entry. The MRS operator moved the No. 3 MRS to the midpoint of the crosscut between the Submains Nos. 1 and 2 entries. Next, he moved the No. 4 MRS behind the No. 3 MRS.

ACCIDENT DESCRIPTION



At this time, victims A and B were standing beside the No. 2 MRS, with victim A at the manual controls, when the mine roof fell, fatally injuring victims A and B. The fall extended from the front of the No. 1 MRS, through the intersection, and 13 feet into the crosscut to the back of the No. 4 MRS.

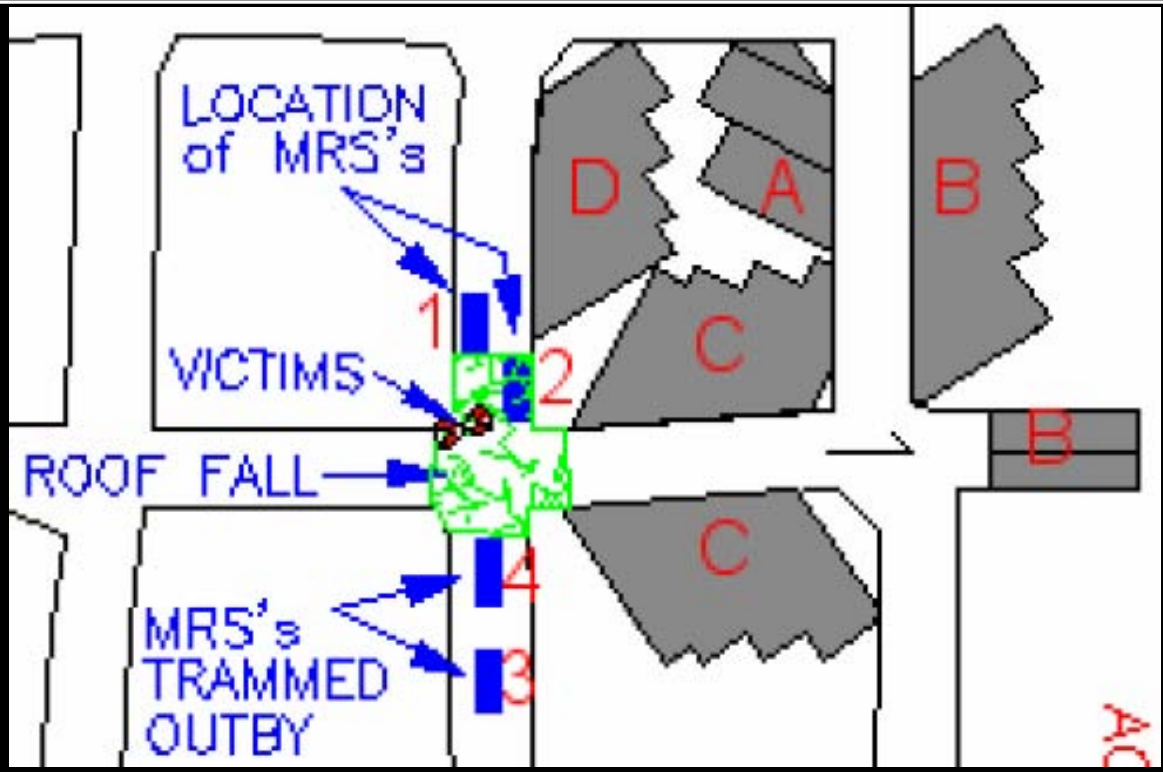
DISCUSSION



Roof Control Practices

Mine management intended that pillar recovery be conducted from left to right across the Submains. Though the day shift section foreman knew this, he decided to mine right to left across the 1 Left Panel. Later that shift, the superintendent visited the section, saw the error, and instructed them to stop taking lifts out of that pillar. The day shift section foreman called out a preshift examination to victim A, which reported no hazards. They did not discuss what was mined or the pillar plan. The superintendent also did not inform the second shift. When the second shift began mining, they started using the left to right pillar plan across the Submains, as originally intended by mine management. Mine management did not change the cut sequence once the superintendent recognized that the intended cut sequence had been compromised.

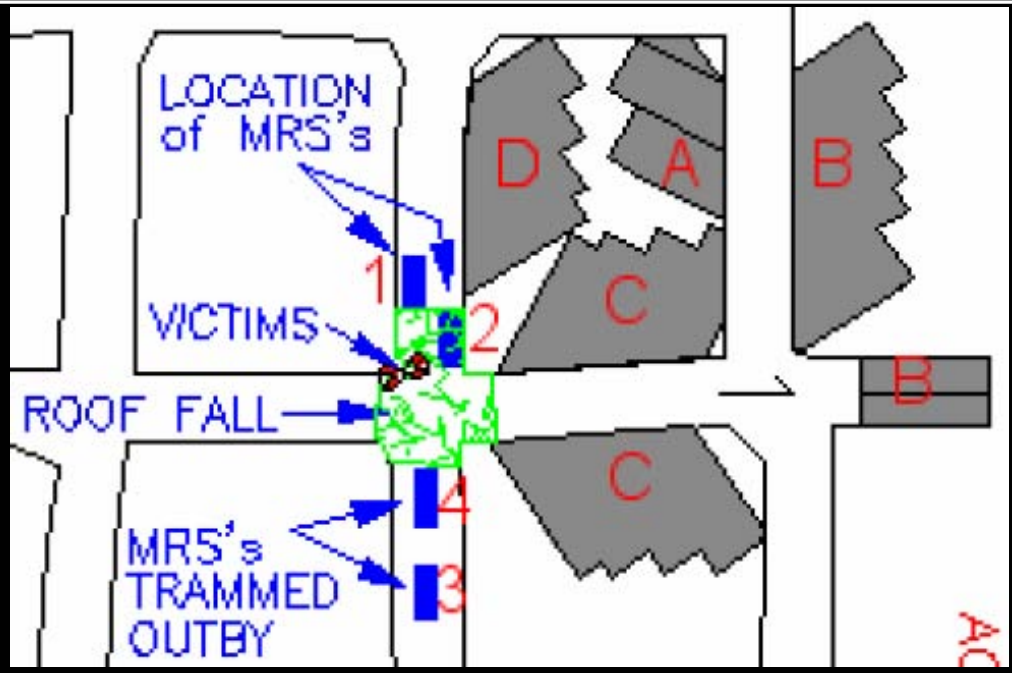
DISCUSSION



Mining Methods

While mining the last lifts out of the pillar, miners were exposed to faulty pillar recovery methods. There were two roadways being utilized when mining the last lifts from the pillar. After the last lift was taken from the right side of the Submains No. 1 entry, the crosscut should have been blocked by the No. 3 and 4 MRS units and only the roadway through the Submains No. 1 entry used. The continuous mining machine cable was also located through the crosscut, which was located adjacent to a pillar that had been reduced in size with no additional roof support provided.

DISCUSSION



Mobile Roof Supports

The approved Roof Control Plan required MRS units to be moved sequentially in pairs so that each unit would not be offset more than one half unit length from its companion unit. However, this provision was not being complied with at the time of the accident. To comply with the plan, the No. 2 MRS should not have been moved past the No. 1 MRS and the Nos. 3 and 4 MRS units should have remained set until the Nos. 1 and 2 MRS units were brought forward into the intersection. Also, the MRS operators were not in a remote location while moving the MRS units, they were in the intersection. This exposed the victims to hazards associated with inadequately supported roof immediately adjacent to the incorrectly positioned MRS units and faulty cut sequence.

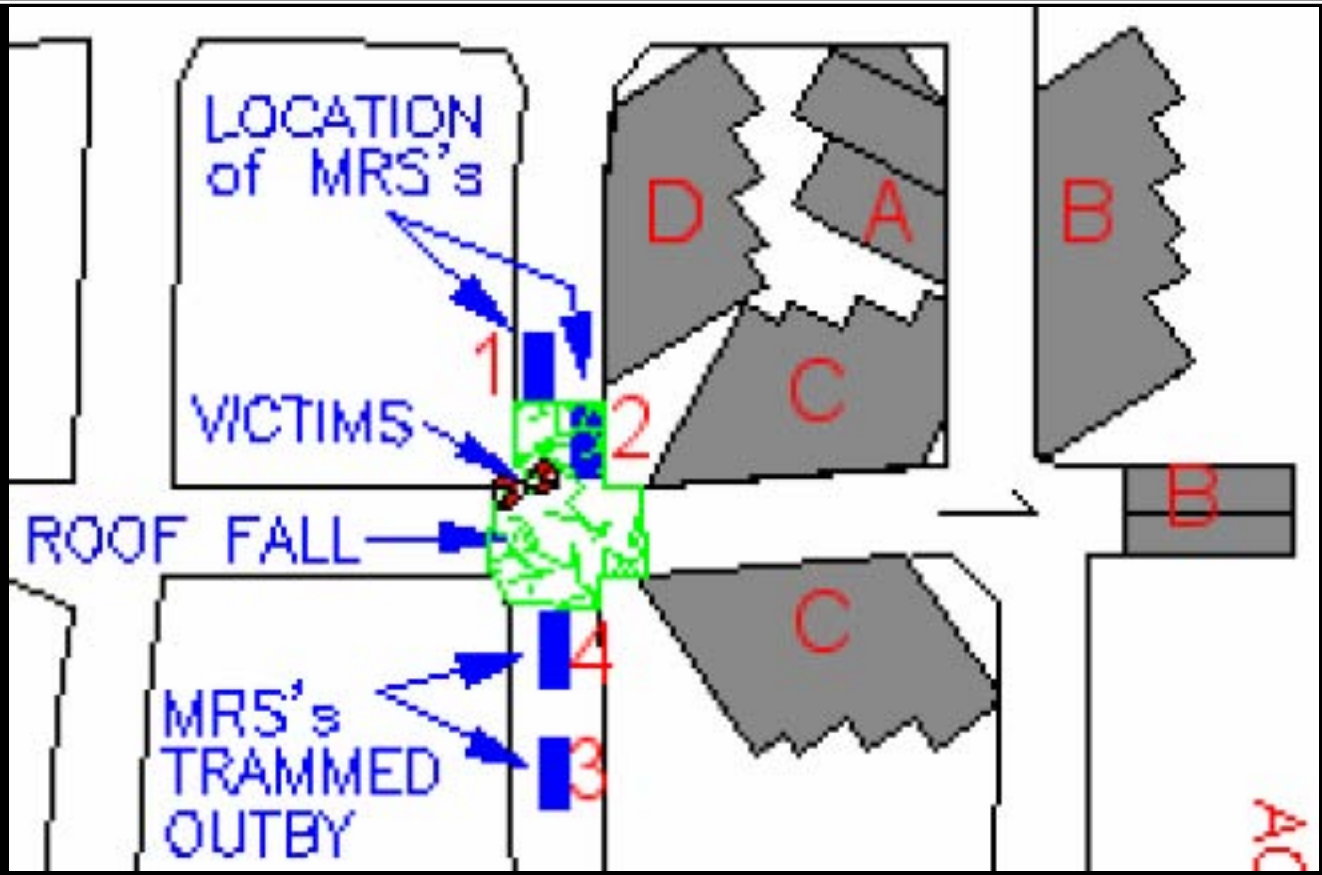
DISCUSSION

Training

Interview statements indicated that mine management did not ensure that the miners understood the lift sequences to be taken while performing the 90 degree change in direction of pillaring or of their normal pillar plan. Mine management did not ensure that the miners possessed an understanding of how the mobile roof supports (MRS) were to be positioned or the miner's location when moving the MRS units. During interviews, miners indicated that they would enter the intersection when lowering the units and would sometimes walk as close as five to six feet from the units when lowering them. They also spun the units around so the cable reel was pointed towards the pillared area and they would position themselves between the MRS unit and the pillared area to watch the MRS unit cable. They discussed moving the MRS units manually when they moved them to the next area to be mined.

Victim A was not task trained in the proper operation of the MRS units being used on the 003 MMU. No record could be provided to indicate that task training had been conducted in the previous 12 months.

DISCUSSION



Hazardous Conditions; Posting, Correcting and Recording

Mine management failed to post the area where a separation had been detected in a roof test hole with a conspicuous danger sign or take corrective action. Two section foremen, one of whom was victim A, knew about the separation at 11 feet and 5 inches, in the intersection. The MRS operator informed victim A about the separation, and this was confirmed by a witness. Also, a different witness confirmed that Boggs told Rutherford about the separation.

ROOT CAUSE ANALYSIS

1. *Causal Factor*: Established standards, policies and administrative controls were not being followed in that provisions in the approved Roof Control Plan regarding mining sequence and MRS operation were not being followed.

Corrective Action: The operator ceased retreat mining and provisions that had permitted pillar recovery were removed from the approved Roof Control Plan. The operator developed an Action Plan to address the lack of communication between mine management personnel.

2. *Causal Factor*: Mine management failed to train all persons in the proper pillar lift sequence and operation of the MRS units.

Corrective Action: The operator developed and implemented an Action Plan that ensured that all miners were trained in all aspects of the Roof Control and Ventilation Plans before returning to mining operations.

ROOT CAUSE ANALYSIS Cont'd.

3. *Causal Factor*: Mine management failed to take corrective action when a separation was found in a 12-foot test hole at 11 feet and 5 inches. Mine management allowed mining operations to continue through the intersection in which the roof fall occurred.

Corrective Action: Mine management shall reinforce the importance of recognizing and taking corrective actions when hazards are encountered. Mine management shall develop procedures to prevent miners from being exposed to hazardous conditions such as inadequately supported mine roof.

4. *Causal Factor*: Mine management exposed miners to the hazards of faulty pillar recovery methods that caused miners to work inby the pillared area of the submains to take the final lifts of the pillar.

Corrective Action: Mine management shall develop procedures to ensure that unsafe pillar recovery methods are not performed.

ROOT CAUSE ANALYSIS Cont'd.

5. *Causal Factor*: Mine management failed to ensure that miners are properly task trained in the proper operation of the MRS units.

Corrective Action: Mine management properly task trained miners in the operation of MRS units. Mine management reviewed task training procedures and developed a system to ensure that all miners are properly task trained prior to operating equipment.

6. *Causal Factor*: Mine management failed to correct the hazard presented by the separation at the intersection, or post a conspicuous danger sign to prevent miners from being exposed to hazards at the intersection where the separation was found at 11 feet 5 inches, and where the lifts were taken out of the backside of the pillar.

Corrective Action: Mine management will ensure that certified persons know and understand the hazards presented by similar separations. Mine management will ensure that certified persons who find hazardous conditions post a conspicuous danger sign to warn miners about the hazards.

ENFORCEMENT ACTIONS

1. A 104 (d) (2) Order, S&S, High negligence, was issued for a violation of 75.220(a)(1). Mine management was not complying with the approved Roof Control Plan. The lift sequence approved in the plan was not being followed when mining the last pillar prior to a roof fall. This resulted in improperly placed MRS units and caused miners to work and travel in inadequately supported approaches to the adjacent pillared area. The approved Roof Control Plan permits only one roadway to the final lifts during retreat mining. However, mine management allowed the use of two roadways to mine the final lifts on the last pillar.

2. A 104 (d) (2) Order, S&S, Reckless Disregard negligence, was issued for a violation of 75.220(a)(1). Mine management was not complying with the additional safety precautions required by the approved Roof Control Plan while using Mobile Roof Support (MRS) units. Employees operating the MRS units were not positioned in a remote location while the units were being moved to another area. The miners were located in the intersection adjacent to where pillars had been partially removed while moving the Nos. 3 and 4 MRS units. The No. 1 MRS was not positioned as required by the plan. The No. 1 MRS was positioned behind the No. 2 MRS. The No. 2 MRS was being operated manually prior to the fall. The MRS units had been operated manually on prior occasions. The No. 3 MRS had been operated manually during the shift when it became stuck. The first shift foreman also admitted manually operating a MRS on other occasions during retreat mining.

ENFORCEMENT ACTIONS Cont'd.

3. A 104 (d) (2) Order, S&S, High negligence, was issued for a violation of 75.220(a) (1). Mine management failed to adequately train all personnel in pillar recovery methods when Mobile Roof Support (MRS) units were being used. When interviewed, miners from both shifts on the section did not exhibit a clear understanding of the requirements of the approved Roof Control Plan, including the lift sequence when mining pillars, the proper location for miners when the MRS units are being moved, and that the MRS units should only be operated by the remote control unit while second mining of pillars.

4. A 104 (d) (2) Order, S&S, Reckless Disregard negligence, was issued for a violation of 75.202(a). Mine management failed to adequately support or otherwise control the roof where persons were required to work or travel. Two miners were moving Mobile Roof Support (MRS) units on the section while they were located in close proximity to the MRS units being moved. Also, the two remaining MRS units on the section had been removed from the approach to the adjacent pillared area, at the intersection immediately outby the location where the miners were working. Prior to the accident, mine management was aware of a separation in the mine roof that was detected in a 12-foot test hole at 11 feet 5 inches in the intersection from which the MRS units were removed, which was also where the roof fall occurred. The roof in the intersection was supported by 4-foot fully grouted roof bolts and 10-foot cable bolts. Additional roof support was not installed or other action taken to assure persons were protected from hazards related to falls of the roof after the separation was detected.

ENFORCEMENT ACTIONS Cont'd.

5. A 104 (d) (2) Order, S&S, Reckless Disregard negligence, was issued for a violation of 75.363(a). Hazardous conditions found and known by mine management were not immediately corrected and the area was not posted with a conspicuous danger sign until the hazardous conditions were corrected. During the second shift, two members of mine management were informed that a separation at 11 feet 5 inches existed in the test hole located in the intersection where the roof fall ultimately occurred. However, no corrective action was taken. Pillar mining continued in the area and miners were exposed to the hazardous condition. Moreover, mine management was aware that two MRS units were moved out of the intersection prior to miners continuing to work in the area. The roof fall was approximately 12 feet thick.

In addition, mine management directed first, second and third shifts to mine the pillars in a left to right sequence across the Submains. During the shift prior to the roof fall, mine management observed lifts taken by the first shift crew on the backside corner of the pillar and the adjacent wall. Once taken, the planned left to right sequence of the Submains could not be conducted without adequate corrective action. Mine management failed to inform the second shift about the lifts taken on first shift and failed to ensure that adequate corrective action was taken. The second shift crew continued the left to right lift sequence as previously directed by mine management. This increased the hazardous conditions that contributed to the roof fall.

ENFORCEMENT ACTIONS Cont'd.

6. A 104 (a) Citation, S&S, High negligence, was issued for a violation of 48.7. Mine management failed to provide a section foreman with task training in the operation of MRS units. This foreman suffered fatal injuries when a roof fall occurred while he was manually operating a MRS in an intersection.

BEST PRACTICES

- Know and follow the approved pillaring procedures in the roof control plan.
- Ensure that the approved pillar extraction sequence is applicable to the panel, as developed, before second mining.
- Be alert for changing roof conditions.
- Conduct a thorough visual examination of the roof, face, and ribs immediately before any work is performed and thereafter as conditions warrant.
- Ensure that mining methods protect miners from hazards of unsupported roof.
- When cracks or other abnormalities in the roof are detected, proper precautions should be followed.